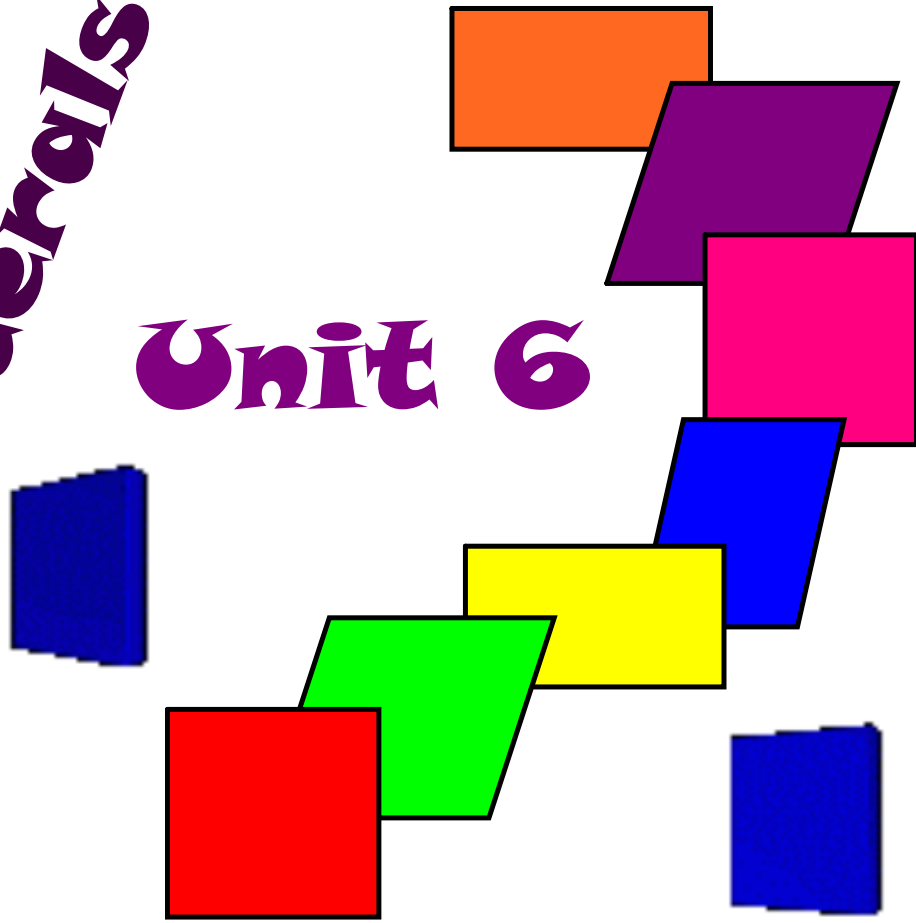


Quadrilaterals

Unit 6



Property		Group 5	Group 4	Group 1	Group 2	Group 3	Group 6
Both pairs of Opposite sides are \parallel							
Exactly 1 pair of Opposite sides are \parallel							
Diagonals are \perp							
Diagonals are \cong							
Diagonals bisect each other							
Both pairs of Opposite sides are \cong							
Exactly 1 pair of Opposite sides are \cong							
All sides are \cong							
Both pairs of Opposite \angle 's are \cong							
Exactly one pair of Opposite \angle 's are \cong							
All \angle 's are \cong							

I. Special Quadrilaterals



A. Quadrilateral: four-sided polygon

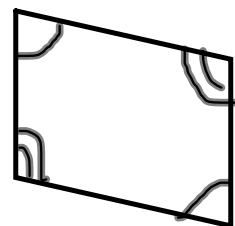
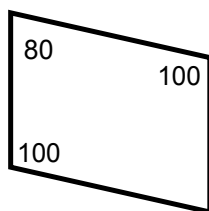
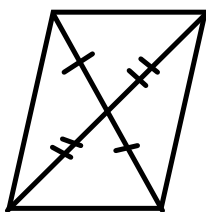
1. Parallelogram: quadrilateral with both pair of opposite sides parallel.
 - a. Rectangle: parallelogram with four right angles.
 - b. Rhombus: parallelogram with four congruent sides.
 - c. Square: rectangle and rhombus.
2. Trapezoid: quadrilateral with exactly one pair of parallel sides
 - a. Isosceles Trapezoid: trapezoid with congruent, non-parallel sides.
3. Kite: quadrilateral with two pairs of adjacent sides congruent but no opposite sides congruent.

II. Parallelogram

A. Properties of a parallelogram

1. Opposite sides are congruent
2. Opposite angles are congruent
3. Diagonals bisect each other
4. Both pairs of opposite sides parallel
5. Consecutive angles are supplementary

Can each be a parallelogram? why or why not



Algebra I practice



Solve the system

1. $-2x + y = 8$
 $3x - 4y = -2$

2. $y = -2x + 9$
 $3x - 4y = 8$

3. $5x + 4y = 6$
 $-2x - 3y = -1$

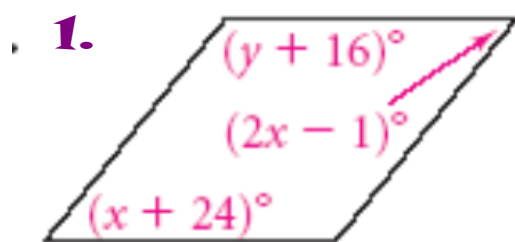
Solve:

4. $x^2 + 4x + 4 = 0$

5. $x^2 - 2x = -1$

6. $x^2 + x = 12$

7. $x^2 = 2x + 15$



$$x + 24 = 2x - 1$$

$$24 = x - 1$$

$$25 = x$$

$$x + 24 + y + 16 = 180$$

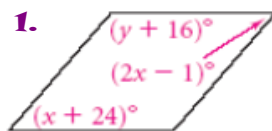
$$25 + 24 + y + 16 = 180$$

$$y + 65 = 180$$

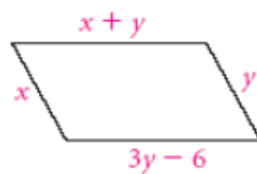
$$y = 115$$

Find the value of x and y for each parallelogram.

1.



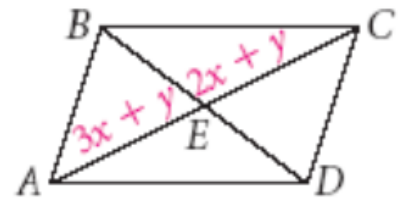
2.



Warm-up

3.

$$AC = 4x + 10$$



$$\begin{aligned} x + 24 &= 2x - 1 \\ 24 &= x - 1 \\ 25 &= x \end{aligned}$$

$$\begin{aligned} x + 24 + y + 16 &= 180 \\ 25 + 24 + y + 16 &= 180 \\ y + 65 &= 180 \\ y &= 115 \end{aligned}$$

$$\begin{aligned} x + y &= 3y - 6 \\ x &= y \end{aligned}$$

$$\begin{aligned} (y) + y &= 3y - 6 \\ 2y &= 3y - 6 \\ -1y &= -6 \\ y &= 6 \end{aligned}$$

$$\begin{aligned} x &= y \\ x &= 6 \end{aligned}$$

$$\begin{aligned} 3x + y + 2x + y &= 4x + 10 \\ 3x + y &= 2x + y \end{aligned}$$

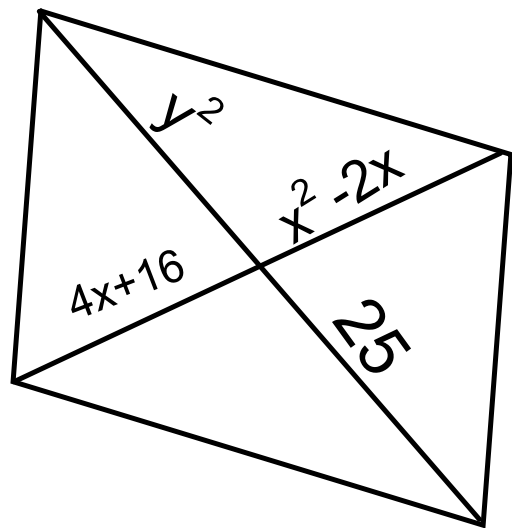
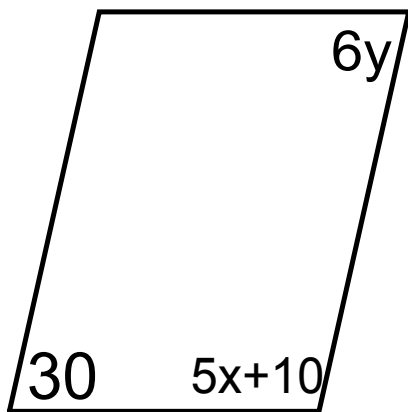
$$5x + 2y = 4x + 10$$

$$\begin{aligned} 3x + y &= 2x + y \\ 3x &= 2x \\ x &= 0 \end{aligned}$$

$$\begin{aligned} 5(0) + 2y &= 4(0) + 10 \\ 2y &= 10 \\ y &= 5 \end{aligned}$$



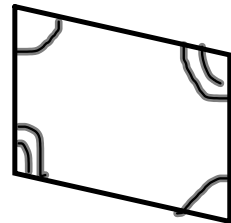
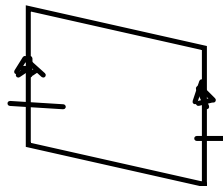
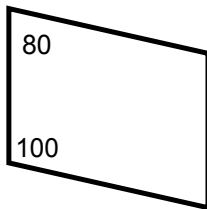
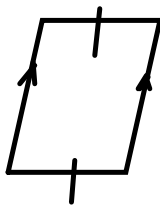
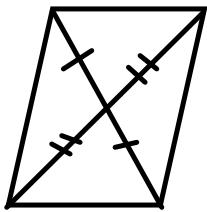
What values of x and y does each need to be to form a parallelogram?



B. Proving Parallelograms

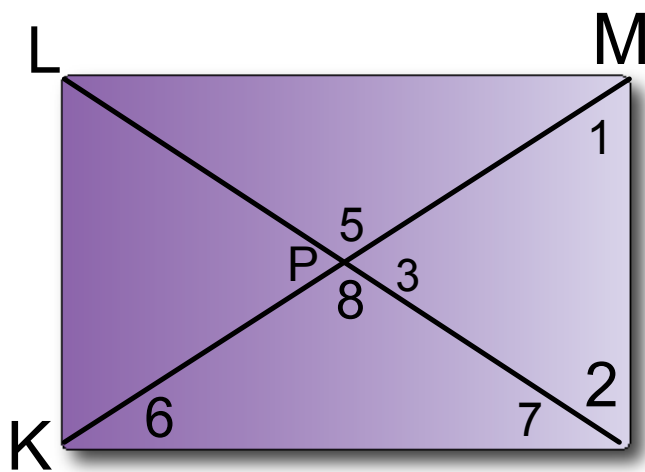
1. Diagonals bisect each other
2. Both pair of opposite angles congruent
3. Both pairs of opposite sides are parallel
4. Both pairs of opposite sides congruent
5. One pair of opposite sides congruent and parallel

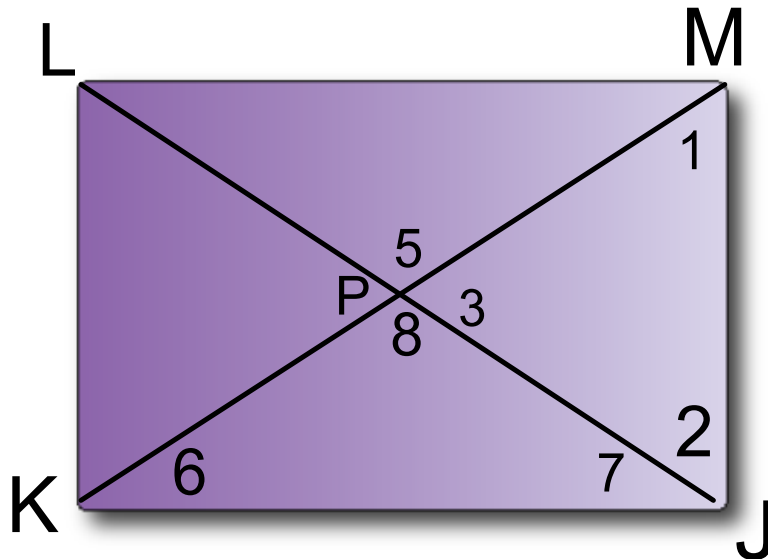
Can each be a parallelogram? why or why not



C. Properties of Rectangle

1. Opposite sides congruent
2. Opposite angles congruent
3. Diagonals bisect each other
4. Diagonals are congruent





$$\begin{aligned} 1. \quad LP &= 3x+6 \\ MK &= 26 \\ x &= \end{aligned}$$

$$\begin{aligned} 2. \quad m\angle 3 &= 50 \\ m\angle 2 &= ? \end{aligned}$$

$$\begin{aligned} 3. \quad m\angle 1 &= x \\ m\angle 7 &= 2x \\ x &= \end{aligned}$$

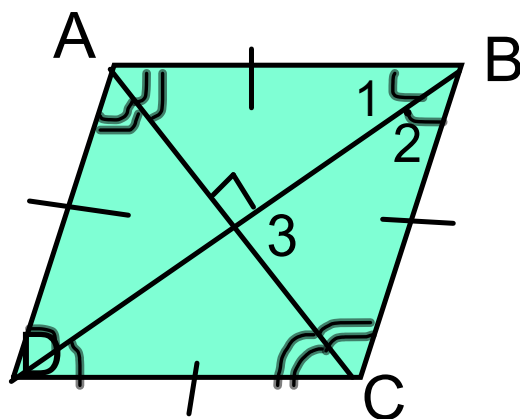
$$\begin{aligned} 4. \quad PM &= x^2 + 1 \\ KP &= 3x + 11 \\ x &= \end{aligned}$$

$$\begin{aligned} 5. \quad m\angle 6 &= 10 \\ m\angle 5 &= ? \end{aligned}$$

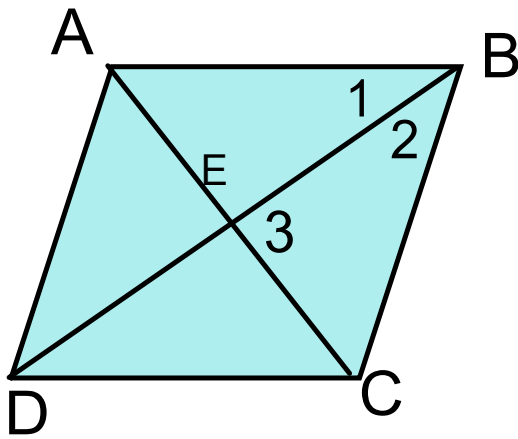
$$\begin{aligned} 6. \quad m\angle 6 &= 2x \\ x &= \angle \\ m \quad 8 &= 8x \end{aligned}$$

D. Properties of Rhombus

1. Opposite sides congruent
2. Opposite angles congruent
3. Diagonals bisect each other
4. Diagonals bisect opposite angles
5. Diagonals are perpendicular



In rhombus ABCD



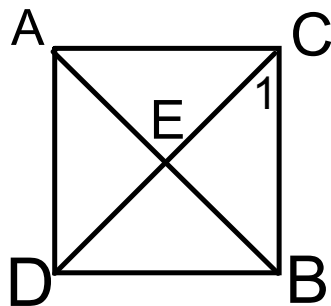
1. $m\angle 1 = 2x + 20$
 $m\angle 2 = 5x - 4$

2. $AC = 15$, $AE = ?$

3. $m\angle 3 = y^2 + 26$
 $y = ?$

E. Properties of Square

1. Opposite sides congruent
2. Opposite angles congruent
3. Diagonals bisect each other
4. Diagonals bisect opposite angles
5. Diagonals are perpendicular
6. Diagonals are congruent



1. $AE = 4$
 $AC =$

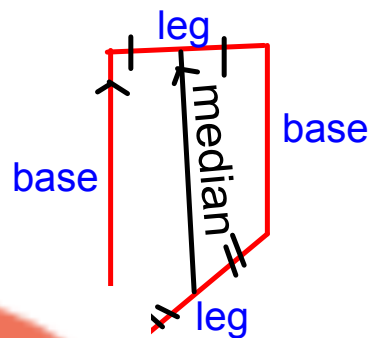
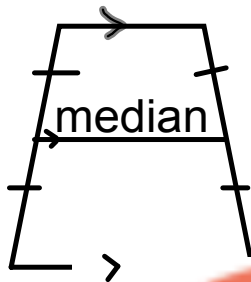
2. $m\angle 1 = 3x - 9$
 $x = ?$

III. Trapezoids and Kites

6.5

A. Trapezoid: quadrilateral with exactly one pair of parallel sides.

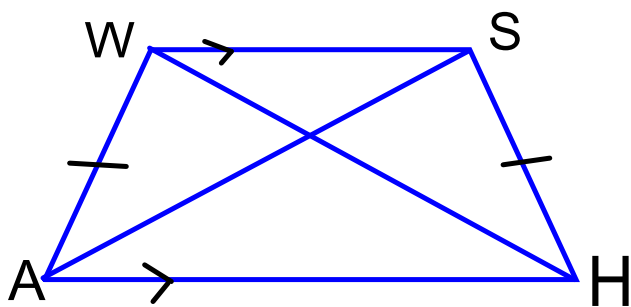
1. Bases: parallel sides
2. Legs: non-parallel sides
3. Base angles: 2 angles that share a base as a side.



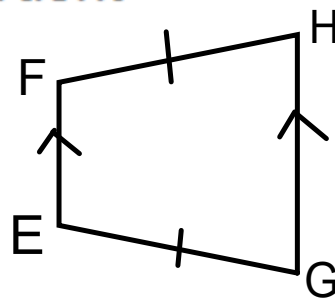
B. Isosceles Trapezoid: trapezoid with congruent legs.

1. Properties of Isosceles Trapezoid

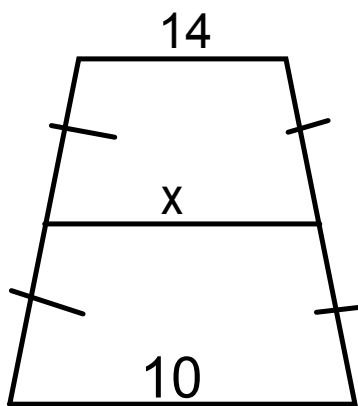
- a. Base angles are congruent
- b. Diagonals are congruent



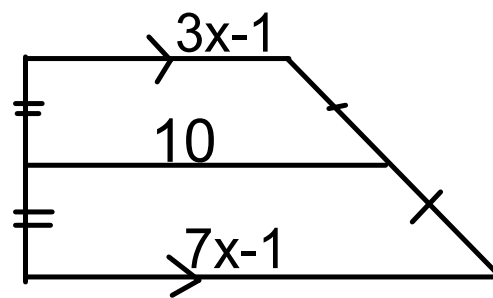
WH = _____
are the diagonals
bisected?



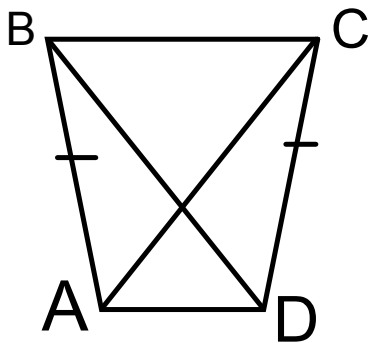
name the base angles
of trapezoid EFGH



$x =$

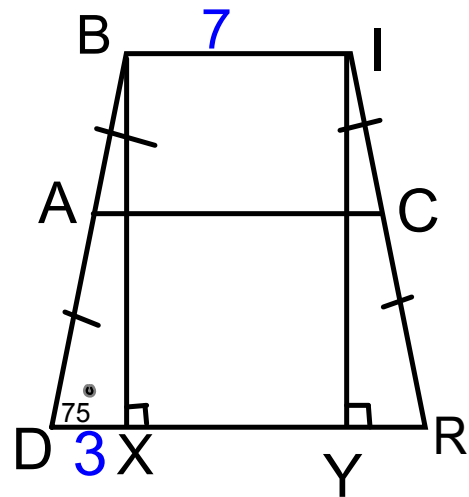


$x =$



1. $AC = 2x+9$
 $BD = 3x-9$
 find $AC + BD$

2. $m\angle BAD = 123$
 $m\angle CBA =$



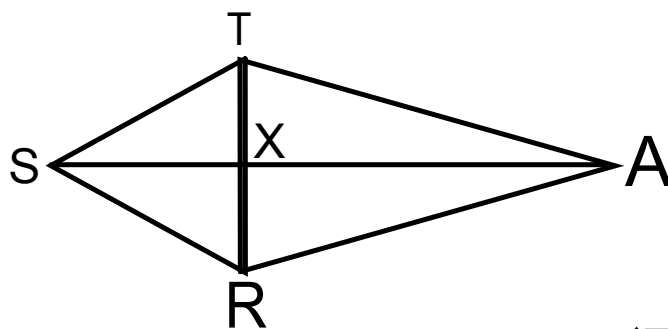
3. $m\angle IRD =$
 $YR =$
 $DR =$
 $AC =$



C. Kite: quadrilateral with two pairs of adjacent sides congruent but no opposite sides congruent.

1. Properties of Kite

a. Diagonals are perpendicular



$m\angle TSX = 25$
find $m\angle STX$

